

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

(Attorney Docket No. 2052)

In re Application of:	)	
	)	
Mark Yarkosky	)	
	)	Group Art Unit: 2617
Serial No. 10/659,647	)	
	)	Examiner: O. Ajibade Akonaj
Filed: September 10, 2003	)	
	)	Confirmation No. 3662
For: METHOD FOR DYNAMICALLY	)	
DIRECTING A WIRELESS	)	
REPEATER	)	

AMENDED APPEAL BRIEF

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**AMENDED APPEAL BRIEF**

Dear Sir:

This Amended Appeal Brief is submitted pursuant to 37 C.F.R. § 41.37(d) and M.P.E.P. § 1205.03, within one month from the "Notice of Non-Compliant Appeal Brief" mailed June 4, 2007. Per the Notice, this Amended Appeal Brief now identifies the claims that are under appeal. Applicant paid the requisite appeal-brief fee upon originally filing the Appeal Brief.

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## **I. Real Party in Interest**

The real party in interest is Sprint Spectrum L.P. (a wholly owned subsidiary of Sprint Nextel Corporation), to which this invention is assigned.

## **II. Related Appeals and Interferences**

Applicant is not aware of any related appeals or interferences.

## **III. Status of Claims**

Claims 7, 9-12, 14, 23-24, and 26-31 are pending, rejected, and all under appeal. Claims 1-6, 8, 13, 15-22, and 25 have been cancelled. A clean set of the pending claims is attached in the Claims Appendix.

## **IV. Status of Amendments**

An amendment after appeal was filed on April 20, 2007, cancelling claims 1 and 15-22. Applicant awaits entry of the amendment after appeal.

## **V. Summary of Claimed Subject Matter**

There are two independent claims: claims 7 and 23. These claims recite a method and wireless repeater, in which an antenna incrementally sweeps across a coverage area and thereby receives wireless signals from a plurality of base stations, the wireless repeater determines characteristics (e.g., carrier-to-cochannel interference ratios) of the signals, and, based on the characteristics, the wireless repeater is directed to radiate amplified signals at a given increment.

More particularly, claim 7 recites a method for dynamically directing a wireless repeater, involving (i) receiving wireless signals by directing an antenna to incrementally sweep its coverage area across a given area, and to thereby receive wireless signals from a plurality of base stations, (ii) the wireless repeater determining carrier-to-cochannel interference ratios of the

received wireless signals, and (iii) based on the carrier-to-cochannel interference ratios, directing the wireless repeater to radiate amplified wireless signals at a given increment.

Further, claim 23 recites a wireless repeater comprising (i) a donor antenna that is operable to communicate with a plurality of base stations and to receive wireless signals over a coverage area by incrementally sweeping across the coverage area, thereby receiving wireless signals from a plurality of base stations, (ii) a mobile station modem that receives wireless signals from the donor antenna and identifies characteristics of the wireless signals received, and (iii) a processor operable to record in data storage the characteristics of the wireless signals received and, based on the characteristics, to direct the donor antenna to radiate amplified wireless signals at a given increment.

The specification as filed explains and illustrates this method and wireless repeater. The specification describes an exemplary wireless repeater, and exemplary operation of such a repeater in the figures and at page 13, line 19 – page 22, line 9. For instance, see Figure 5, and page 3, lines 1-19; page 17, line 10 – page 18, line 4; page 18, lines 16-22; page 19, lines 1-23; and page 20, line 17 – page 21, line 7.

As described in the specification, a wireless repeater may include a donor antenna that communicates wirelessly with one or more base stations, a build out circuit that amplifies signals, and a coverage antenna that communicates wirelessly with one or more client stations (e.g., mobile stations). Further, the donor antenna of an exemplary wireless repeater may sweep over a coverage area to collect signals in various increments from various base stations. As the donor antenna collects those wireless signals, a processor of the wireless repeater may determine a carrier-to-cochannel interference ratio of each received signal. The processor may then determine the increment in which the received wireless signal exhibited the highest carrier-to-

cochannel interference ratio, and the processor may direct the repeater to repeat amplified signals on the reverse link (in the direction of the base station) in that particular increment. Thus, based on its measurements of carrier-to-cochannel interference ratios for wireless signals received from base stations as it sweeps across a coverage area, the repeater will select an increment on which to transmit amplified signals on the reverse link.

## **VI. Grounds of Rejection to Be Reviewed on Appeal**

Claims 7, 9, 12, 16, 17, 23, and 30 stand rejected under 35 U.S.C. § 103 as being allegedly obvious over U.S. Patent No. 7,003,261 (Dietz) in view of U.S. Patent No. 6,782,277 (Chen). Claim 10 stands rejected under 35 U.S.C. § 103 as being allegedly obvious over Dietz in view of Chen in view of U.S. Patent No. 5,907,794 (Lehmusto). Claims 11, 14, 15, and 24 stand rejected under 35 U.S.C. § 103 as being allegedly obvious over Dietz in view of Chen in view of U.S. Patent Application Pub. No. 2003/0162550 (Kuwahara). Claims 26 and 31 stand rejected under 35 U.S.C. § 103 as being allegedly obvious over Dietz in view of Chen in view of U.S. Patent No. 5,534,872 (Kita). Claim 27 stands rejected under 35 U.S.C. § 103 as being allegedly obvious over Dietz in view of Chen in view of Kita in view of U.S. Patent No. 6,799,024 (Wang). And claims 28 and 29 stand rejected under 35 U.S.C. § 103 as being allegedly obvious over Dietz in view of Chen in view of Kita in view of Wang in view of U.S. Patent No. 6,567,460 (Tak).

## VII. Argument

### 1. The Examiner Clearly Erred in Rejecting Claims 7, 9-12, and 14

Of these claims, claim 7 is independent and stands rejected as being allegedly obvious over Dietz in view of Chen. Applicant submits that the Examiner clearly erred in rejecting claim 7, because the Examiner failed in at least two ways to establish the requisite *prima facie* case of obviousness of the recited invention. First, the Examiner failed to even allege that Dietz and Chen teach the combination of elements recited in claim 7. And second, combining Dietz and Chen together as suggested by the Examiner would not result in the invention recited in claim 7.

#### a. The Examiner Failed to Allege that Dietz and Chen Teach the Combination of Elements Recited by Claim 7

M.P.E.P. §§ 2142 and 2143 dictate that an Examiner bears the initial burden to establish a *prima facie* case of obviousness of a claimed invention, and that the applicant is under no obligation to submit evidence of nonobviousness if the Examiner fails to produce a *prima facie* case. One of the key requirements of establishing a *prima facie* case of obviousness is establishing that all of the limitations of the claimed invention are taught or suggested by the prior art. *See* M.P.E.P. § 2143.03. In this case, the Examiner failed to establish the requisite *prima facie* case of obviousness of claim 7, because the Examiner failed as a basic matter to even allege that the cited art teaches all of the limitations recited in claim 7. Thus, the Examiner clearly erred in rejecting claim 7 on grounds of obviousness under 35 U.S.C. § 103.

As set forth in the Claims Appendix, claim 7 recites a method for dynamically directing a wireless repeater, the method comprising: (i) receiving wireless signals by directing an antenna to incrementally sweep its coverage area across a given area, and to thereby receive wireless signals from a plurality of base stations, (ii) the wireless repeater determining carrier-to-cochannel

interference ratios of the received wireless signals, and (iii) based on the carrier-to-cochannel interference ratios, directing the wireless repeater to radiate amplified wireless signals at a given increment.

In the final office action, when rejecting claim 7 as being allegedly obvious over Dietz in view of Chen, the Examiner never alleged that Dietz and/or Chen teaches the claim element of "receiving wireless signals by directing an antenna to incrementally sweep its coverage area across a given area, and to thereby receive wireless signals from a plurality of base stations."

Rather, apparently regarding this element, the Examiner asserted at best that "Dietz discloses . . . based on the carrier-to-cochannel interference ratio, the wireless repeater repeating the wireless signals (the repeater 60 will handoff to a cell based on the signal strength, and it is well known that signal attributes can also include cochannel interference caused between two cells transmitting on the same frequency within a network, see fig. 3, col. 5, lines 40-53)." Further, the Examiner asserted that Chen teaches an antenna receiving signals at increments, and the antenna transmitting and receiving as it sweeps through increments. (*See* final office action, at page 4, lines 1-13.)

However, even if Dietz discloses a wireless repeater repeating wireless signals, even if it is known that signal attributes can include cochannel interference, and even if Chen teaches an antenna receiving and transmitting at increments, the Examiner never asserted that Dietz or Chen or a combination of Dietz and Chen would in any way disclose or suggest the claim 7 element of "based on the carrier-to-cochannel interference ratios, directing the wireless repeater to radiate amplified wireless signals at a given increment." Thus, the Examiner has failed to produce the requisite *prima facie* case of obviousness of claim 7, and Applicant therefore does not bear a burden to produce any evidence of non-obviousness of claim 7.



**b. Combining Dietz and Chen Would Not Result  
in the Invention Recited by Claim 7**

The Examiner generally rejected the invention of claim 7 on grounds of obviousness over Dietz in view of Chen. However, even accepting the Examiner's specific assertions for sake of discussion, the combination of Dietz and Chen would not result in the invention recited in claim 7. Thus, the Examiner failed to establish *prima facie* obviousness of claim 7 over Dietz in view of Chen.

Claim 7 recites "receiving wireless signals by directing an antenna to incrementally sweep its coverage area across a given area, and to thereby receive wireless signals from a plurality of base stations." Dietz and Chen fail to teach directing an antenna to incrementally sweep its coverage area across a given area and to thereby receive wireless signals from a plurality of base stations.

Dietz suggests nothing at all about an antenna incrementally sweeping its coverage across a given area. Chen, on the other hand, teaches a ***base station antenna*** incrementally sweeping its coverage across a given area. However, it is clear that the antenna of Chen cannot be the antenna to which claim 7 refers, since the antenna of Chen is a base station antenna that receives signals from mobile stations, and Chen does not suggest anything about that base station antenna sweeping and thereby ***receiving signals from a plurality of base stations***.

In rejecting claim 7, the Examiner asserted that "Dietz discloses . . . causing an antenna (antenna 25, see fig. 1, col. 2, lines 7-11) of the wireless repeater (mounted transmission repeater 60, see fig. 1, col. 2, lines 7-11, col. 5, line 43) to receive wireless signals from a plurality of base stations (inherent, since the repeater 60 uses the signal attributes of the cells 44 and 47 to determine which of the cells to handoff to, indicating that it has received signals from the base

stations of the cells, see fig. 3, col. 5, lines 40-53)". (See final office action, at page 3, lines 14-20.)

Applicant notes that the columns and line numbers of Dietz that the Examiner cited do not seem to exist. Dietz does not have column numbers or line numbers. Rather, Dietz has page numbers and paragraph numbers. Furthermore, the specific columns and lines to which the Examiner referred do not stand for the propositions asserted by the Examiner.

In addition, even though the antenna of repeater 60 in Dietz receives signals from a plurality of base stations, there is no disclosure or suggestion in Dietz that the repeater antenna incrementally sweeps its coverage area across a given area to thereby receive wireless signals from a plurality of base stations, as recited in claim 7. Moreover, the Examiner's assertion that "the repeater 60 uses the signal attributes of cells 44 and 47 to determine which of the cells to handoff to" is not supported by the disclosure of Dietz and is inapposite in any event. In Dietz, it is the *cell phone* that hands off from one base station to another, transparently through one or more repeaters; Dietz does not mention anything about a repeater handing off between base stations or using signal attributes in such a handoff process. In any event, even if Dietz did disclose a repeater handing off from one base station to another, there is no suggestion in Dietz for an antenna (e.g., the repeater antenna) to incrementally sweep its coverage area across a given area and to thereby receive wireless signals, as recited in claim 7.

If Dietz and Chen were to be combined together as contemplated the Examiner, the logical result would not be the invention recited in claim 7. At best, the logical result would be that the Chen *base station antenna* would sweep over a coverage area to determine an angle at which to communicate with a particular cell phone that happens to be communicating with the Chen base station through one or more Dietz *repeaters*.

Because the logical combination of Dietz and Chen would not result in the invention recited in claim 7, *prima facie* obviousness of claim 7 over Dietz and Chen does not exist.

**c. Claims 7, 9-12, and 14 are Allowable**

Because the Examiner has failed to make out a *prima facie* case of obviousness of claim 7, Applicant submits that claim 7 is allowable. Further, without conceding the Examiner's assertions regarding dependent claims 9-12 and 14, Applicant submits that claims 9-12 and 14 are allowable for at least the reason that they each depend from allowable claim 7.

**2. The Examiner Clearly Erred in Rejecting Claims 23-24 and 26-31**

Of these claims, claim 23 is independent and stands rejected as being allegedly obvious over Dietz in view of Chen. Applicant submits that the Examiner clearly erred in rejecting claim 23, because the Examiner failed in at least two ways to establish the requisite *prima facie* case of obviousness of the recited invention. First, the Examiner failed to even allege that Dietz and Chen teach the combination of elements recited in claim 23. And second, combining Dietz and Chen together as suggested by the Examiner would not result in the invention recited in claim 23.

**a. The Examiner Failed to Allege that Dietz and Chen Teach the Combination of Elements Recited by Claim 23**

As noted above, M.P.E.P. §§ 2142 and 2143 dictate that an Examiner bears the initial burden to establish a *prima facie* case of obviousness of a claimed invention, and that the applicant is under no obligation to submit evidence of nonobviousness if the Examiner fails to produce a *prima facie* case. As with claim 7, the Examiner failed to establish the requisite *prima facie* case of obviousness of claim 23, because the Examiner failed as a basic matter to even allege that the cited art teaches all of the limitations recited in claim 23. Thus, the Examiner clearly erred in rejecting claim 23 on grounds of obviousness under 35 U.S.C. § 103.

As set forth in the Claims Appendix, claim 23 recites a wireless repeater comprising (i) a donor antenna that is operable to communicate with a plurality of base stations and to receive wireless signals over a coverage area by incrementally sweeping across the coverage area, thereby receiving wireless signals from a plurality of base stations, (ii) a mobile station modem that receives wireless signals from the donor antenna and identifies characteristics of the wireless signals received, and (iii) a processor operable to record in data storage the characteristics of the wireless signals received and, based on the characteristics, to direct the donor antenna to radiate amplified wireless signals at a given increment.

In the final office action, when rejecting claim 23 as being allegedly obvious over Dietz in view of Chen, the Examiner never alleged that Dietz and/or Chen teaches a wireless repeater comprising "a processor operable to record in data storage the characteristics of the wireless signals received and, based on the characteristics, to direct the donor antenna to radiate amplified wireless signals at a given increment."

Rather, apparently regarding this element, the Examiner asserted at best that "Dietz discloses a repeater . . . comprising . . . a processor operable to record in data storage the wireless signals received (inherent, since it is well known that a processor comprising a computer readable program in a memory device is required to execute the task of receiving signals from the cells 44 and 47 and comparing their signal to noise ratios, see col. 5, lines 40-54) and, based on the characteristics, to direct the donor antenna to radiate amplified wireless signals (the repeater 60 uses the signal attributes of the cells 44 and 47 to determine which of the cells to handoff to, see fig. 3, col. 5, lines 40-53)." Further, the Examiner asserted that Chen teaches an antenna receiving signals at increments, and the antenna transmitting and receiving as it sweeps through increments. (*See* final office action, at page 7, line 4 – page 8, line 13.)

However, even if Dietz discloses a wireless repeater with a processor that records wireless signals received and in some manner based on those signals directs a donor antenna to radiate amplified signals, even if it is known that a processor can compare signal to noise ratios, and even if Chen teaches an antenna receiving and transmitting at increments, the Examiner never asserted that Dietz or Chen or a combination of Dietz and Chen would in any way disclose or suggest the claim 23 element of "a processor operable to record in data storage the characteristics of the wireless signals received and, based on the characteristics, *to direct the donor antenna to radiate amplified wireless signals at a given increment.*" (Emphasis added.)

More specifically, claim 23 recites directing the donor antenna of a wireless repeater to radiate amplified signals at a given increment. The Examiner never alleged that either Dietz or Chen teaches directing the donor antenna of a wireless repeater to radiate amplified signals at a given increment. Further, claim 23 recites doing so based on the identified characteristics of wireless signals received by the wireless repeater. And the Examiner never alleged that either Dietz or Chen teaches that aspect either.

Thus, the Examiner has failed to produce the requisite *prima facie* case of obviousness of claim 23, and Applicant therefore does not bear a burden to produce any evidence of non-obviousness of claim 23.

**b. Combining Dietz and Chen Would Not Result  
in the Invention Recited by Claim 23**

The Examiner generally rejected the invention of claim 23 on grounds of obviousness over Dietz in view of Chen. However, even accepting the Examiner's specific assertions for sake of discussion, the combination of Dietz and Chen would not result in the invention recited in

claim 23. Thus, the Examiner failed to establish *prima facie* obviousness of claim 23 over Dietz in view of Chen.

Claim 23 recites a wireless repeater including "a donor antenna that is operable to communicate with a plurality of base stations and to receive wireless signals over a coverage area by incrementally sweeping across the coverage area, thereby receiving wireless signals from a plurality of base stations." Dietz and Chen fail to disclose or suggest a wireless repeater having a donor antenna that is operable to communicate with a plurality of base stations and to receive wireless signals over a coverage area by incrementally sweeping across the coverage area, thereby receiving wireless signals from a plurality of base stations."

Dietz suggests nothing about a wireless repeater having a donor antenna that incrementally sweeps its coverage across a given area. Chen, on the other hand, teaches a ***base station antenna*** incrementally sweeping its coverage across a given area. However, as noted above, it is clear that the antenna of Chen cannot be the antenna to which claim 23 refers, since the antenna of Chen is a base station antenna that receives signals from mobile stations, and Chen does not suggest anything about that base station antenna sweeping and thereby ***receiving signals from a plurality of base stations***.

In rejecting claim 23, the Examiner asserted that "Dietz discloses . . . a repeater . . . comprising a donor antenna (antenna 25, see fig. 1, col. 2, lines 7-11) that is operable to receive wireless signals over a plurality of base stations (inherent, since the repeater 60 uses the signal attributes of the cells 44 and 47 to determine which of the cells to handoff to, indicating that it has received signals from the base stations of the cells, see fig. 3, col. 5, lines 40-53)". (*See final office action*, at page 3, lines 14-20.)

Applicant notes again that the columns and line numbers of Dietz that the Examiner cited do not seem to exist, since Dietz does not have column numbers or line numbers. Further, the specific columns and lines to which the Examiner referred do not stand for the propositions asserted by the Examiner.

In addition, even though the antenna of repeater 60 in Dietz receives signals from a plurality of base stations, there is no disclosure or suggestion in Dietz that the repeater antenna incrementally sweeps across a coverage area, thereby receiving wireless signals from a plurality of base stations, as recited in claim 23. Moreover, the Examiner's assertion that "the repeater 60 uses the signal attributes of cells 44 and 47 to determine which of the cells to handoff to" is not supported by the disclosure of Dietz and is inapposite in any event. As noted above, it is the *cell phone* in Dietz that hands off from one base station to another, transparently through one or more repeaters; Dietz does not mention anything about a repeater handing off between base stations or using signal attributes in such a handoff process. In any event, even if Dietz did disclose a repeater handing off from one base station to another, there is no suggestion in Dietz for a donor antenna of the repeater to incrementally sweep its coverage area across a given area and to thereby receive wireless signals from a plurality of base stations, as recited in claim 23.

If Dietz and Chen were to be combined together as contemplated the Examiner, the logical result would not be the invention recited in claim 23. At best, as noted above, the logical result would be that the Chen *base station antenna* would sweep over a coverage area to determine an angle at which to communicate with a particular cell phone that happens to be communicating with the Chen base station through one or more Dietz *repeaters*.

Because the logical combination of Dietz and Chen would not result in the invention recited in claim 23, *prima facie* obviousness of claim 23 over Dietz and Chen does not exist.

**c. Claims 23-24 and 26-31 are Allowable**

Because the Examiner has failed to make out a *prima facie* case of obviousness of claim 23, Applicant submits that claim 23 is allowable. Further, without conceding the Examiner's assertions regarding dependent claims 24 and 26-31, Applicant submits that claims 24 and 26-31 are allowable for at least the reason that they each depend from allowable claim 23.

**3. Conclusion**

Applicant has demonstrated that the rejections of claims 7, 9-12, 14, 23-24 and 26-31 are in error as a matter of law. Applicant therefore requests reversal of the rejections and allowance of the claims.

Respectfully submitted,  
**MCDONNELL BOEHNEN  
HULBERT & BERGHOFF LLP**

Date: June 14, 2007

By: /Lawrence H. Aaronson/  
Lawrence H. Aaronson  
Reg. No. 35,818



## CLAIMS APPENDIX

1-6. (Cancelled)

7. (Previously Presented) A method for dynamically directing a wireless repeater, the method comprising:

receiving wireless signals by directing an antenna to incrementally sweep its coverage area across a given area, and to thereby receive wireless signals from a plurality of base stations;

the wireless repeater determining carrier-to-cochannel interference ratios of the received wireless signals; and

based on the carrier-to-cochannel interference ratios, directing the wireless repeater to radiate amplified wireless signals at a given increment.

8. (Cancelled)

9. (Previously presented) The method of claim 7, wherein receiving the wireless signals by directing an antenna to incrementally sweep its coverage area across a given area comprises receiving the wireless signals from a plurality of directional antenna components, where each directional antenna component is operable to receive wireless signals from a given coverage area.

10. (Previously Presented) The method of claim 7, further comprising for each of the received wireless signals, storing in data storage a coverage area identifier corresponding to an increment from which the wireless signals were received.

11. (Original) The method of claim 7, further comprising determining a PN-offset of each received wireless signal.

12. (Previously Presented) The method of claim 7, wherein directing the wireless repeater to radiate amplified wireless signals at a given increment comprises directing the wireless repeater to radiate the amplified wireless signals at an increment corresponding to a strongest carrier-to-cochannel interference ratio.

13. (Cancelled)

14. (Previously Presented) The method of claim 7, further comprising radiating the amplified signals in a direction of a given sector of a given base station.

16-22. (Cancelled)

23. (Previously Presented) A wireless repeater comprising:  
a donor antenna that is operable to communicate with a plurality of base stations and to receive wireless signals over a coverage area by incrementally sweeping across the coverage area, thereby receiving wireless signals from a plurality of base stations;

a mobile station modem that receives wireless signals from the donor antenna and identifies characteristics of the wireless signals received; and

a processor operable to record in data storage the characteristics of the wireless signals received and, based on the characteristics, to direct the donor antenna to radiate amplified wireless signals at a given increment.

24. (Original) The wireless repeater of claim 23, wherein the characteristics are selected from the group consisting of PN-offsets of the wireless signals and signal to noise ratios ( $E_C/I_O$ ) for each PN offset.

25. (Cancelled)

26. (Previously Presented) The wireless repeater of claim 23, wherein at each increment, the donor antenna receives wireless signals and passes the wireless signals to the processor which records in the data storage the increment at which each wireless signal was received.

27. (Original) The wireless repeater of claim 26, wherein the mobile station modem includes a rake receiver that identifies PN-offsets in the wireless signals.

28. (Original) The wireless repeater of claim 27, wherein the processor records in the data storage the PN offsets and signal-to-noise ratios of the wireless signals at each increment.

29. (Original) The wireless repeater of claim 28, wherein the processor instructs the donor antenna to radiate the amplified wireless signals to a base station that corresponds to an increment where the mobile station modem detected a highest signal-to-noise ratio.

30. (Original) The wireless repeater of claim 23, wherein the donor antenna is an antenna selected from the group consisting of an omni-directional antenna, a directional antenna, and a phased array antenna.

31. (Original) The wireless repeater of claim 23, wherein the donor antenna is a phased array antenna, and wherein the processor records the phase of the phased array antenna at which each wireless signal is received, and based on the characteristics of the wireless signals, directs the phased array antenna to radiate the amplified wireless signals at a given phase.

## **EVIDENCE APPENDIX**

This appendix is empty.

## **RELATED PROCEEDINGS APPENDIX**

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